

Name \_\_\_\_\_

Date \_\_\_\_\_

## Warm-Up: How Do New Species Form?

<sup>1</sup> The theory of evolution says that species change over time. Did you ever wonder how new species evolve? Natural selection seems to explain how variations can lead to changes in a species. **Geographic isolation** seems to be one of the main ways this happens. This geographic separation from others of their species seems to be what made different species evolve on the Galapagos Islands. The six-hundred-mile separation of the islands from the mainland may have led to those animals evolving into new species. After many changes evolve in a group of animals, individuals of that group can no longer mate with the rest of the species that remain unchanged. That is the definition of species: individuals that are able to breed among themselves but are not able to breed with other species.

<sup>2</sup> When a group of individuals is separated from the rest of their species for a long time, the individuals can evolve different traits. The longer the group is isolated from the rest of the species, the more likely it will evolve into a new species. One example of this has been seen in fish species in the lakes of Switzerland, Great Britain, and Scandinavia. Almost every lake has different forms, believed to have evolved from one species.

<sup>3</sup> Groups of living things can become separated in different ways. Rivers can change their course. Volcanoes and mountain ranges form. New islands are created. Ocean waves can carry small groups many miles away and put them down in a new place. This is believed to be how many animals got to the Galapagos Islands.

<sup>4</sup> Geographic isolation, also called allopatric speciation, can happen in a small area that is isolated from other areas, like the Galapagos Islands. Geographic isolation can also happen on a large scale worldwide. Millions of years ago, the Earth's landmasses were joined together. This supercontinent was called Pangaea. Individuals could roam freely over all of Earth's land. Pangaea split apart over millions of years. This is called continental drift.

<sup>5</sup> As Pangaea broke apart, geographic isolation caused species to evolve in different ways. As the continents drifted, new climates and new surroundings caused species to develop new characteristics to deal with the changes. For example, the animals living in Australia have been geographically isolated from all other animals on Earth for more than a hundred million years.

<sup>6</sup> Because of this, animals have evolved in Australia that are found nowhere else in the world. Many of the Australian mammals are marsupials. Only a few marsupials exist on other continents. This leads scientists to infer that geographic isolation was a cause of natural selection.

<sup>7</sup> The Galapagos finches are believed to be the descendants from a small group of finches that reached the islands from the mainland. They were probably blown off-course during a storm and came to the islands in that way. Once on the Galapagos, the birds began to evolve independently. This was caused by their adaptation to the different environments of the individual islands. It was also caused by random genetic drift—not adaptations. Much research has shown that this is a major reason why there are so many different species throughout the world.

<p>1. What is one of the main ways that new species form?</p> <p>_____</p> <p>_____</p>	<p>2. What is geographic isolation?</p> <p><input type="radio"/> A When Pangaea broke apart into separate continents</p> <p><input type="radio"/> B When some members of a species fail to have offspring</p> <p><input type="radio"/> C When some members of a species become separated from the rest of the species by geographical means</p> <p><input type="radio"/> D When some members of a species interbreed with new species</p>
<p>3. What is another name for geographic isolation?</p> <p><input type="radio"/> A Natural selection</p> <p><input type="radio"/> B Sympatric speciation</p> <p><input type="radio"/> C Continental drift</p> <p><input type="radio"/> D Allopatric speciation</p>	<p>4. The longer a group remains isolated from the rest of the species:</p> <p><input type="radio"/> A The less likely it is to evolve into a new species</p> <p><input type="radio"/> B The more likely it is to evolve into a new species</p> <p><input type="radio"/> C Has no bearing on whether it will evolve into a new species</p> <p><input type="radio"/> D All of the above</p>
<p>5. Animals in Australia:</p> <p><input type="radio"/> A Probably represent animals that never evolved</p> <p><input type="radio"/> B Probably represent animals that came from other geographic locations</p> <p><input type="radio"/> C Probably became geographically isolated and evolved into new species</p> <p><input type="radio"/> D Probably represent animals that have never changed over time</p>	

Briefly describe/define the following: (3 pts each)

1. Species
  
2. Allopatric speciation
  
3. Pangaea
  
4. Galapagos finches